S 70 Nr. 8 f)

$e^{2x} + 10 = 6{,}5 e^x \quad | \text{ Sub: } u = e^x$

$u^2 + 10 - 6{,}5u = 0$

$u_{1,2} = +\frac{13}{4} \pm \sqrt{\left(\frac{13}{4}\right)^2 - 10} = \frac{13}{4} \pm \frac{3}{4} \Rightarrow u_1 = \frac{10}{4} = 2{,}5$

$u_2 = \frac{16}{4} = 4$

Rücksub: $e^x = 2{,}5$ $\qquad e^x = 4$

$x_1 = \ln(2{,}5) \approx 0{,}916 \qquad x_2 = \ln(4) \approx 1{,}386$

S 70 Nr 8 g)

$(e^{2x} - 6)(5 - e^{3x}) = 0$

$(e^x - \sqrt{6})(e^x + \sqrt{6})(5 - e^{3x}) = 0$

$e^x - \sqrt{6} = 0 \Rightarrow e^x = \sqrt{6} \Rightarrow x_1 = \ln\sqrt{6} = \underline{x_1 = \ln\left(6^{\frac{1}{2}}\right) = \frac{1}{2}\ln(6) \approx 0{,}896}$

$e^x + \sqrt{6} = 0 \Rightarrow e^x = -\sqrt{6}$ keine Lösung

$5 - e^{3x} = 0 \Rightarrow e^{3x} = 5 \Rightarrow 3x = \ln(5) \Rightarrow \underline{x_2 = \frac{1}{3} \cdot \ln(5) \approx 0{,}536}$

S 70 Nr 8 h)

$2 \cdot e^x + 15 = 8 \cdot e^{-x} = \frac{8}{e^x} \quad | \text{ Sub: } e^x = u$

$2 \cdot u + 15 = \frac{8}{u} \quad | \cdot u \Rightarrow 2u^2 + 15u = 8 \Rightarrow 2u^2 + 15u - 8 = 0$

$u_{1,2} = \frac{-15 \pm \sqrt{15^2 - 4 \cdot 2 \cdot (-8)}}{2 \cdot 2} = \frac{-15 \pm 17}{4} \Rightarrow u_1 = -8 \vee u_2 = \frac{1}{2}$

Rücksub: $e^x = -8$ ↯ keine Lösung $\qquad e^x = \frac{1}{2}$

$x_1 = \ln\left(\frac{1}{2}\right) = \ln(1) - \ln(2) = 0 - \ln(2)$

$\underline{x_1 = -\ln(2) \approx -0{,}693}$